CLOSURE WITH TAMPER-EVIDENT MEANS

This invention can be used in the food industry. The invention relates in general to multi-purpose closures used for bottling and storing expensive high-quality drinks.

Known is a closure comprising a discharge sleeve with outer and inner pipes at its inlet end, a collar with an external thread at its outlet end, an inner hood with splines on its side exterior surface and a pouring tube at its outlet end, a removable gate with a check valve member, said gate being installed on the exterior side surface of the inner pipe and having sealing lips on its exterior surface and a flange on its outlet end, said flange being located between the inner and the outer pipes. The outer pipe has longitudinal ribs on its interior surface. The collar of the discharge sleeve has a plug installed therein, said plug being supported by raking props and used to shut off the pouring tube. The inner hood is threadedly engaged on the collar of the discharge sleeve thereby to allow its axial movement resulting from rotation.. The outer hood has a tamper-indicating means at its outlet end, splines on its interior side surface thereby to engage splines on the inner hood, and shoulders to interact with the inlet end of the outer pipe of the discharge sleeve. The discharge sleeve has windows evenly spaced around its periphery (patent RU №34928 U1, 7 B 65 D 47/20, 20.12.2003).

This apparatus proved to be effective, but it can not prevent the unauthorized opening of the bottle and refilling it with low-quality drinks. Besides, bottles can not be closed reliably because some parts of the closure are cast or stamping, they can not be fabricated to high precision standards and may be assembled with gaps. In particular, fabricating the mating surfaces of the pouring tube of the inner hood and the plug of the discharge sleeve in the form of a cylinder does not guarantee a minimal gap between them after assembling, which can result in evaporation and leaks of the fluid stored and transported in the bottle. This apparatus makes it possible to find out tampering with the bottle

due to using a break-off member, but this break-off member can be replaced, glued and flattened accurately. After that, it is difficult to say if there has been tampering or not.

Besides, the valve member and the seat of the removable gate do not provide the necessary tightness, as the valve member will be shaked during transportation and handling.

The technical result of the proposed invention is a more reliable closing of bottles, providing the necessary tightness, and making refilling the bottle with low-quality drinks less possible.

The mentioned technical result is achieved in that the closure comprises a discharge sleeve with outer and inner pipes at its inlet end, a collar with an external thread at its outlet end, an inner hood with splines on its side exterior surface and a pouring tube at its outlet end, a removable gate with a seat and a check valve member, said gate being installed on the exterior side surface of the inner pipe and having sealing lips on its exterior surface and a flange on its outlet end, said flange being located between the inner and the outer pipes. The outer pipe has longitudinal ribs on its interior surface. The collar of the discharge sleeve has a plug installed therein, said plug being supported by raking props and used to shut off the pouring tube. The inner hood is threadedly engaged on the collar of the discharge sleeve thereby to allow its axial movement resulting from rotation. The outer hood has a tamper-indicating means at its outlet end, splines on its interior side surface thereby to engage splines on the inner hood, and shoulders to interact with the inlet end of the outer pipe of the discharge sleeve. The discharge sleeve has windows evenly spaced around its periphery.

The mating surfaces of the pouring tube and the plug are tapered.

The tamper-indicating means at the outlet end of the outer hood is made as a break-away member fixed on the end surface by means of at least three break-away strips, which are spaced evenly around the periphery of the interior surface of the end of the outer hood, or by means of a solid annular break-away strap located at the interior surface of the end of the outer hood.

The valve member is made of a material which ensures its tight abutment to the seat of the removable gate, e.g. glass, crystal glass, marble. A sealing gasket is placed between the outer pipe and the inner pipe of the discharge sleeve.

The longitudinal ribs on the interior surface of the outer pipe are separated or arranged in groups to interact with the mating surface of the bottleneck collar.

Tapered form of the mating surfaces of the plug and the pouring tube allows their tight gapless jointing. This makes closing more reliable and tight, preventing evaporation and leaks.

Making the tamper-indicating means, installed at the outlet end of the outer hood, as a break-off member fixed on the end surface by means of at least three breakable strips, which are spaced evenly around the periphery, or by means of a solid annular breakable strap located at the interior surface of the end of the outer hood, prevents tampering.

If an unauthorized opening of the bottle has been taken place, the break-off member can not be replaced inconspicuously, as there is a small gap in the ruptured zone on the exterior surface of the end of the *outer hood*, and the restoration of this rupture can be easily detected.

If the breakable strap is solid, the closure can not be contaminated with a foreign matter, e.g. dust.

Making of the valve member as a ball of glass, crystal glass, or marble provides its tight abutment to the seat of the removable gate due to its weight, which makes closing more reliable and makes refilling the bottle with low-quality drinks less possible. During pouring, when the bottle is tilted, the glass ball rises over the seat easily and fast and makes it possible to accurately measure the poured liquid. Besides, a glass ball is very hard and durable, and therefore contributes to reliable operation of the removable gate as a whole.

The presence of the sealing gasket between the outer pipe and the inner pipe of the discharge sleeve provides enhanced tightness and good condition of the content of the stored bottle.

The longitudinal ribs on the interior surface of the outer pipe, which are separated or arranged in groups to interact with the mating surface of the

bottleneck collar, utterly prevent rotation of the closure relative the bottleneck.

The proposed invention will now be explained by way of the non-limiting description of the preferred embodiments and with the reference to the accompanying drawings in which:

Figure 1 is a view of the section of the closure;

Figure 2 is a view of the section of the hood;

Figure 3 is a view of the section of the discharge sleeve without the removable gate.

The closure comprises a discharge sleeve 1 with an outer pipe 2 and an inner pipe 3, the outer pipe having longitudinal ribs 4 and a collar 5 with an external thread 6, an inner hood 7 with splines 8 and a pouring tube 9, said inner hood being engaged to the collar 5 of the discharge sleeve 1 by means of a thread 10, a removable gate 11 including a seat 12 and a check valve member 13, a sealing lip 14, a flange 15, an outer hood 16 with splines 17, transverse projections 18, a break-off member 19, and breakable strips 20. There is a plug 21 inside the collar 5 of the discharge sleeve 1, which is supported by raking props 22 and used to shut off the pouring tube 9, and there are windows 23 with inwardly bent projections 24 on the wall of the discharge sleeve 1 above the longitudinal ribs 4, said windows being spaced evenly around the periphery of the discharge sleeve.

The mating surfaces 25 of the pouring tube 9 and the plug 21 are tapered.

The closure can be equipped with a sealing gasket 26.

The proposed closure will be assembled and used as follows.

The inner hood 7 is screwed hard on the discharge sleeve 1, which results in the plug 21 closing tightly the bore of the pouring tube 9. Then the discharge sleeve containing the inner hood will be inserted fully into the outer hood 16, thereby the splines 17 of the outer hood 16 engage the splines 8 of the inner hood 7, and the lower end of the outer hood 2 is restrained against the axial movement by means of the transverse projections 18. Afterwards, the valve member 13 will be placed into the removable gate 11, and the removable gate will be inserted into the discharge sleeve through the inlet end using some force. The sealing gasket 26

will be installed onto the flange 15, if necessary. The assembled closure will be forced hard onto the bottleneck. After that, the inwardly bent projections 24, sealing lips 14, located on the exterior surface of the removable gate 11, and the splines 17 sit tight on the bottleneck, inside and outside. As a result, the bottle is sealed tightly.

To open the closure for the first time, the outer hood 16 will be screwed counterclockwise, thereby breaking the strips 20 and releasing the break-off member 19 due to the rise of the inner hood 7 relative to the collar 5. As a result, the bore in the pouring tube 9 opens, and the contents of the bottle can be discharged.

To close the bottle, the outer hood should be fully screwed clockwise.